become grey as soon as the velocity is six or seven turns in a second.

It is possible also to obtain motion without the presence of magnets by guiding an impulse to the movable by an exterior force, and M. de Fonvielle and M. Lontin insisted on that particular point in the memoir they have presented jointly to the Paris Academy in offering a theory of these curious phenomena. The rotation is not always the same, but once it is determined in a solid sufficiently balanced it continues indefinitely in the same direction. The direction does not change when we reverse the direction of the currents by means of a commutator.

The possibility of producing the same movement by means of movables of any form whatever, in presence of magnets or without their action, and notably of two spirals constructed of a flat wire and wound in an opposite direction, appears to the inventors to demonstrate that the rotatory action is exercised individually on each molecule of iron, and that the total impulse must be regarded as the integral of the individual impulsive actions. This remarkable property appears to furnish a very simple means of completely explaining all the circumstances of these curious phenomena by means of the known laws of induction, and to dispense with having recourse to any new hypothesis. It is sufficient, in fact, to remark that the molecule of iron acts in its movement of rotation in two different ways in each of the two nearly equal currents of induction which successively traverse the spires. In fact, during the whole continuance of the two phases of rotatory movement which the galvanometric frame brings closer together, each molecule of soft iron increases the intensity of the current which affects it, and which the inventors call *positive*, independently of its real direction, in order to fix the idea; at the same time it diminishes that of the current which repels it, and which they call *negative*, for the same reasons. In the two other phases of its movement the same molecule diminishes the intensity of the positive current, which then tends to draw it back, and increases that of the negative current, which turns it away from the frame. The actions exerted in the two phases of the movement, that is, in the total extent of the plane described by the molecules, tend then to keep up the continuous rotation, which progressively increases in speed until it reaches that which corresponds to the absolute intensity of the attractions or repulsions exercised by the currents induced, by the energy of the inductive current, the value of the friction of the resistance of the arc, &c.

When we bring the pole of a magnet into action, it is clear that its influence determines in each of the molecules of the movable object a transient magnetisation which strengthens the induction currents produced in the spires in the cases in which it is concordant, and which paralyses them in the opposite case. It hence results that, in presence of a permanent magnetic centre, the movement is possible only in a direction determined by its position and its nature. MM. De Fonvielle and Lontin believe that this principle applies even to the action of the earth.

When we change the position of the active pole in relation to the axis of rotation, the rotation changes its direction; but the pole of the magnet may be placed above or below, to right or left, without the rotation changing its direction. The two poles of a bar or a horseshoe magnet combine to accelerate the movement when they are placed in the direction of the frame; but if we place the magnet in a perpendicular direction, all movement is, as a rule, rendered impossible. It is the same with near position; in proportion as we approach it to that limit of position, the rotation in general will be found to slacken. It is clear that a magnetisable body so strongly tempered as not to have the capacity of being magnetised and demagnetised to the given extent, will remain insensible to these successive dynamic reactions, and consequently immovable, and that it is necessary to employ the softest possible iron in the construction of the movable objects. The same phenomena, especially with the spiral, may evidently be produced if we place it about the frame. They are accompanied, especially with the full disk, by a strident sound, by alternate magnetisations and demagnetisations. Their production appears to the inventors a new confirmation of the theories which they have advanced.

We must add that the coil used is of a peculiar construction, but that at least some of the phenomena can be observed without any Ruhmkorff's machine at all, but with an interrupter of the current from the battery.

It is impossible to say at present if the apparatus may be rendered serviceable as a motive power. But it may be used at all events not only as exhibiting a new mode of action, but as a balance to make a comparison of the force of several magnets, by placing them in opposition at various distances.

NOTES

McGILL University, Montreal, has long held the lead in the cultivation of natural science among the colleges of Canada, and has already large collections, which are still further to be increased by the liberality of Mr. Redpath, a member of the Board of Governors, and Principal Dawson. Mr. Redpath proposes to erect on the College grounds, and on a site which will harmonise with the arrangement of the existing buildings, a stately and beautiful edifice for a museum of geology and natural history, primarily for the use of the professors and students of the college, but also for the benefit of the public generally. The building is to be detached and practically fireproof, and while it will be an ornament to the college grounds, will be fully up to the present idea of museum buildings in regard to space, light, and means for study and illustration. It will accommodate the whole of the present collections of the University, and will enable them for the first time to be fully accessible to students. In connection with Mr. Redpath's gift, Principal Dawson purposes to present to the University the whole of his private collections in geology, embracing the types of the species which have been described by him in his papers and other publications. In some departments of the geology of the Dominion, as in the fossils of the Pleistocene and Carboniferous, and in the geology of the Maritime Provinces, these collections are believed to be the most important ex ant.

THE International Congress of Anthropology and Prehistoric Archæology holds its next meeting at Lisbon, on September 20–29, this year. Several important questions concerning the prehistoric archæology of Portugal will be discussed. Excursions will be made to several places of archæological interest.

A UNIVERSAL exhibition of prehistoric German anthropology will take place at Berlin in August. All the German States have been invited to join in this exhibition, which will comprise objects chosen from every museum in Germany. Prof. Virchow is at the head of the Committee appointed to organise the necessary details.

THE Institution of Mechanical Engineers holds its ordinary general meeting to-day and to-morrow, April 23, at 7.30 p.m. The following papers will be read and discussed:—"Remarks on Chernoff's Papers on Steel," by Mr. William Anderson, of Erith; "On Permanent Way for Tramways, with special reference to Mechanical Traction," by Mr. J. D. Larsen, of London; "On Water-Pressure Engines for Mining Purposes," by Mr. Henry Davey, of Leeds; "On Electric Lighting" (second paper), by Dr. John Hopkinson, F.R.S., of London

Sir Henry Bessemer, F.R.S., has been presented with the freedom and livery of the Turners' Company.

Among Mr. Murray's list of announcements are: "The Circumnutation of Plants," by Charles Darwin; "The Life and Discoveries of David Livingstone," by Dr. W. G. Blaikie; "Unbeaten Tracks in Japan," by Miss Bird; "Siberia in Europe: a Naturalist's Visit to the Valley of the Petchora," by Mr. H. Seebohm; "Eastward Ho! Journal of a Naturalist and Botanist in the Forests and Swamps of New Guinea," by Mr. F. W. Burbidge.

The State of Connecticut has taken to heart the teachings of science with regard to the prevalence of colour-blindness, and its General Assembly has passed an Act authorising the State Board of Health to prepare rules and regulations for the examination and re-examination of railroad *employés* in regard to colour-blindness and visual power, and prescribing the method in which, and the intervals at which, such examinations shall be made. The Board is annually, in the month of May, to recommend two or more medical experts to make the necessary examinations and the Governor, on or before July 1 following, is to appoint two of these gentlemen, who will issue certificates. The Act further makes provision for inflicting penalties on any railway company employing a person who is not in possession of a regular certificate of freedom from colour-blindness, or whose certificate shall at any time have been revoked by the examiners. May we hope that our new Government will impose some such sweeping reform upon our reckless railway companies?

The *American Art Review* publishes an account by Mr. F. W. Putnam of an attempt at archæological imposture. In the course of an excavation made in December last in a small burial mound at Yalaha, Lake Harris (on the Ocklawaha), Sumter County, Florida, there was found a little figure of ordinary brick clay, identical in design with many of the statuettes so common in the Egyptian tombs, and known under the general name of Osirids. This little figure was sent to Mr. F. W. Putnam for examination at the Peabody Museum in Cambridge, U.S., and after a careful study he has little hesitation in saying that all the facts he has been able to gather bear witness against its genuineness, in so far as attributing it to the workmanship of the builders of the Florida mounds is concerned. Nor can it be made a link in the chain of supposed evidence by which it is sought to establish a belief in a connection of the early nations of America with the people of Egypt. That the discoverer is entirely clear of all attempt to impose on the public, Mr. Putnam states, is self-evident, as he was suspicious of the antiquity of the object the moment he took it from the mound, and sent it to the Museum in order to have its character determined, if possible. At the same time the finder states that, so far as he observed, the mound had not been disturbed before he commenced to dig. It would seem from this as if a careful "plant" had been made for the purpose of imposing on any one who might happen to open the mound, which, from the large number of relic-hunters who annually visit Florida, would probably be very soon. The front part of the statuette has the appearance of having been cast in a mould made by pressing an original Egyptian specimen in plaster, face down, while the back of the figure shows signs of having been cut with a knife when the clay was still soft. The freshness of the surface of the object tells perhaps more than anything else against its antiquity. In fact to one used to looking at and handling ancient pottery this little statue has the appearance of having just been taken from a place where it had been carefully kept from dirt and from hands since the moment it was made. In connection with this "Osirid" from Florida, it has been stated, Mr. Putnam says, that similar objects were recently found in South America, and are now publicly exhibited in the National Museum at Buenos Ayres. This museum is said to possess, "among the antiquities taken from tumuli in the pampas, mummies, images, and sarcophagi, as fresh, and decorated with as brilliant hieroglyphics, as any exhibited in the famous galleries of the Louvre or other foreign museums containing Egyptian collections." In the published reports of the museum in question, so far as accessible, Mr. Putnam does not find any such objects mentioned. He has therefore taken steps to ascertain the trustworthiness of the report. In regard to the antiquity of the mounds in Florida, Mr. Putnam states that while many of the burial mounds are unquestionably very ancient, it is particularly to Florida we turn to prove the continuance of mound-building by some Indian tribes down to a time long after the appearance of Europeans in that region. In support of this statement we have historical evidence, and also the fact that in many of the mounds in Florida there have been found objects of European origin, such as glass beads, iron implements, glazed pottery, and ornaments of brass, silver, and gold.

A fish and Fishing Exhibition on an unusually large scale was opened at Berlin on Tuesday by the Crown Prince of Germany. The exhibition seems to be admirably arranged, the worst represented country being England. The correspondent of the *Daily News*, animadverting on this, says: "It is a great pity that England sends almost nothing. As far as I can hear, the entire blame rests with the English Government, which refused to give any support or encouragement to the affair. The consequence is that out of the fifty-three whose names were down as exhibitors only seventeen have appeared, which means really that if Mr. Buckland had not sent a rather interesting collection of casts and Messrs. Bartlett and Sons fair specimens of rods and fishing-tackle, the English Department would have been virtually empty. I believe this is the first time that England has been last on the list in an International Exhibition, and I could not help remarking that the Crown Prince was very much surprised at this as he passed through the English Department. Switzerland beats us entirely. The public here evidently expected a great deal from England. However, they must console themselves with the very interesting collection which the United States have sent over."

A stalactite cave, with prehistoric animal remains, is stated to have been discovered near Menhadu, on the Romano-Hungarian frontier.

Prof. Prosdocismi, of the Este Museum, who discovered a prehistoric cemetery on the slope of the hills overlooking that town, has unearthed in the same vicinity eighty-two tombs, forty-four of them violated apparently during the Roman period, the rest untouched, with all their pottery and bronzes. The urns are of three periods, some coloured black, with linear ornamentation, others adorned with circles and wavy lines; others with alternate bands of red and black. Some of the accessory vases might serve as elegant models for modern potters. The bronze ornaments are also very interesting, and a bronze chest bears three designs, comprising in all seventeen warriors and a priest, seven animals (horses, oxen, stags, birds, and a dog), several plants, and a kind of chariot with a man seated in it. The Professor considers these the finest prehistoric remains in Italy. Remains of lake-dwellings have been discovered in a peat-bog near Milan, and in a street in Milan excavations for a house have brought to light what are believed to be vestiges of the old Roman theatre.

In a paper read at the American Philosophical Society Mr. Horatio Hale gave an interesting account of his acquaintance with the various Indian tribes collected on the Canadian reservation at Brantford, east of London, Upper Canada; of the most distinguished surviving chief of the Six Nations, Sakayenkwaraton (disappearing mist), known to the English as John S. (smoke)

Johnson, now eighty-seven years old. His son, Chief George Johnson, bears the official title of the one of the original fifty council chiefs whom he represents. Mr. Hale described the formation of the confederation, three centuries ago, and testified to the accuracy of Mr. Morgan's history of it. He then described the "Book of Rites," which, after two centuries of verbal tradition, was reduced to writing by some one connected with the early missions. Two copies exist, and Mr. Hale is obtaining a translation of it. It is the only known American aboriginal piece of literature north of Mexico. It has many archaic words, and is engrossed, in an old-fashioned current English hand, in a common schoolboy's copybook. He also described the wampum belts of the confederation, partly preserved by the Onondagas in New York, and partly among the Indians in Canada. He told of his discovery that the Tutelos were not an Iroquois tribe, but were allied to the Dakotahs or Sioux of the West. Their first seat was in North Carolina. Brainard reported that Tutelos, Iroquois, and Delawares lived together at Shamokin, Pa., speaking three entirely different languages. The syntactical position of the personal pronoun before, after, or betweeen any two syllables of the verb allies the Tutelo language with the two dialects of the Dahcotah, and separates it from all the other Indian dialects. But Tutelo seems to be older than the Dahcotah. So also Huron (Quebec) was older than Iroquois (Six Nations); and Delaware older than Chippeway. It looks as if the movement was from east to west, and not from west to east.

FROM an inquiry as to cetaceans which have perished on the coasts of the Mediterranean and of the West of France during the years 1878 and 1879 M. van Beneden (*Bull. de l'Acad. Roy. de Belgique*, No. 2) finds there were two species of Balænoptera on the former, *Musculus* and *Rostrata*, and two *Giphius cavirostris*, which was believed to have disappeared some years since as a living species. On the west coast of France there perished three *Balænoptera musculus*, one *Megaptera boops*, and one Ziphioid female, whose rudimentary teeth are unknown.

DR. LYON PLAYFAIR has been re-elected representative in Parliament of the Universities of Edinburgh and St. Andrews.

IN reference to the note on the Walker Prize, awarded to Dr. Leidy (NATURE, vol. xxi. p. 451), we should state that the sum awarded to Prof. Agassiz was, like that awarded to Dr. Leidy, 1,000 dollars.

THE sums placed at the disposal of the French Minister of Agriculture and Commerce for the purpose of encouraging research and experiments as to the best way of dealing with the phylloxera, amounted, in 1879, to 500,000 francs, and this will be increased during the present year by supplementary grants to 969,750f. Of this amount 200,000f. are devoted to the treatment of diseased vines in the districts specified by the superior commission, while 250,000f. will be given to doubling the grants voted by the various departmental and municipal bodies. Societies and companies formed for the investigation of the disease will also be assisted by bonuses to the aggregate amount of 300,000f. A further sum of 100,000f. is set aside towards encouraging the propagation of American vine stocks and the distribution of new plants and cuttings from the Agricultural School at Montpelier. Rewards to the amount of 100,000f. will be given for furthering microscopic researches, while 50,000f. are left for dealing with individual cases.

A CHICAGO agricultural journal gives an account of the largest plough ever known to be made, which has been recently turned out by an Illinois firm of agricultural machinery-makers for use on the St. Louis, Iron Mountain, and Southern Railway. It is attached to a platform car of a construction train in such a way as to cut its ditch a sufficient distance from the railway line. It will make one mile of ditch 2 feet deep and 3 feet wide, every four hours, thus doing the work of about 1,000 men. The beam is made of swamp oak, and is 8 inches by 14 inches, the land side being made of bar iron 8 inches wide and 1½ inch thick, which had to be forged expressly for the purpose. Its total weight is 1,700 lb.

FROM China we hear that Mr. Molesworth has lately gone up the Yangtsze-kiang, in order to open coal-mines in the Nganhiong province, where he hopes eventually to introduce foreign machinery.

THE additions to the Zoological Society's Gardens during the past week include a Brown Bear (*Ursus arctos*) from Asia Minor, presented by Commander Atwell Lake, R.N.; two Common Wombats (*Phascolomys wombat*) from Tasmania, presented by Dr. J. C. Cox; two Nutmeg Finches (*Munia undulata*) from India, a Chestnut-breasted Finch (*Donacola castaneothorax*) from Queensland, presented by Mrs. Hylton Joliffe; a Himalayan Bear (*Ursus tibetanus*) from North India, deposited; an Eyra Cat (*Felis eyra*) from South America, a Short-nosed Perameles (*Perameles obesula*), a Stanley Broadtail (*Platycercus icterotis*) from Australia, two Scaly-breasted Parrakeets (*Trichoglossus chlorolepidotus*) from New South Wales, a Blue-crowned Hanging Parrakeet (*Loriculus galgulus*) from Malacca, two Red-naped Fruit Pigeons (*Carpophaga paulina*) from Celebes, an Elate Hornbill (*Buceros elatus*) from West Africa, two Black-necked Swans (*Cygnus nigricollis*) from Antarctic America, three Wheatears (*Saxicola œnanthe*), a Meadow Pipit (*Anthus pratensis*), European, five Eyed Lizards (*Lacerta ocellata*), South European, purchased; a Collared Fruit Bat (*Cynonycteris collaris*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE SOUTHERN COMET.—There appears now to be no reasonable doubt that the comet which has attracted so much attention in the southern hemisphere is identical with the great comet which was observed in almost all parts of the habitable world in March, 1843. Dr. Gould succeeded in obtaining observations for position at Cordoba up to the evening of February 19, though the head was then only recognised "as a scarcely perceptible whiteness in the field of the large equatorial of 28½ centimetres aperture." On the following evening it was not distinguishable, though having a good ephemeris, the observers knew that it must be in the field of the telescope, which fully accounts for the comet having been unsuccessfully sought with large instruments in this hemisphere, amongst others with Mr. Common's powerful reflector at Ealing. Dr. Gould publishes the following parabolic elements founded upon his observations of February 6, 12, and 18; an orbit deduced by Mr. Hind from the Cordoba places of February 6, 9, and 14, which is annexed, will be seen to differ in no material degree from Dr. Gould's. The longitudes are for 1880·0.

	GOULD	HIND
Perihelion passage G.M.T. ...	Jan. 27·6188 ...	Jan. 27·62195
Longitude of perihelion ...	279° 52′ 11″ ...	279° 45′ 1″
,, ascending node	6 10 30 ...	5 55 37
Inclination	35 20 21 ...	35 22 52
Log. perihelion distance ...	7·739364 ...	7·745636
Motion	Retrograde ...	Retrograde

On comparing the accounts so far received of the appearance of the comet of 1880, while in some general features, as the great length and narrowness of the tail, &c., there is a close resemblance to the descriptions of the comet of 1843, it will be found that the head at least was probably more brilliant in the first days after perihelion in 1843, though as in the present year its brightness very quickly faded. We do not hear of the comet having been detected in broad daylight near the sun, soon after the perihelion passage as in 1843, when it was remarked only a few degrees distant from the sun's limb, at various places in the United States, in Italy and off the Cape of Good Hope; in that year the comet crossed the sun's disk without being observed in transit. In the present year the comet has not transited the sun, but according to Mr. Hind's orbit would have the following positions within the twenty-four hours after perihelion:—